

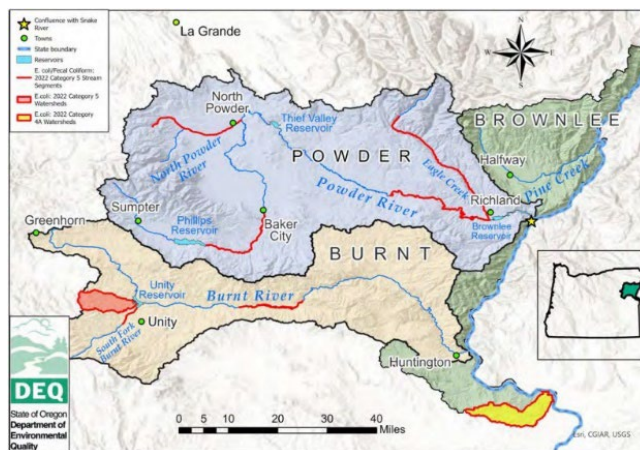
Fact Sheet

Powder River Basin

Bacteria Water Quality Improvement Plan, January 2024

The Oregon Department of Environmental Quality is developing a water quality improvement plan known as a Total Maximum Daily Load, or TMDL, for bacteria in the Powder River Basin. A TMDL analyzes sources of pollution and identifies pollution reduction efforts to improve water quality.

The federal Clean Water Act requires a TMDL for water bodies that do not meet water quality standards. Water quality standards protect streams, rivers, and lakes for various uses, including drinking water, farming, livestock watering, fishing, and hunting.



The TMDL identifies a pollutant load allocation for each pollutant source. For “point sources,” such as wastewater treatment plants, DEQ limits pollutants through requirements in wastewater permits. For “nonpoint sources,” such as agriculture, DEQ and partners oversee a series of TMDL implementation planning activities.

Why is this needed for the Powder River Basin now?

Various stretches of waterways in the Powder River Basin contain fecal bacteria above safe levels. Fecal contamination of water poses serious risk of illness for people, livestock, and wildlife. Adults and children may be at risk from swimming, fishing, rinsing hands, playing along the riverbanks, or eating fresh produce irrigated with the water. Livestock and wildlife may be at risk from drinking fecal contaminated water. Water quality impairments caused by bacteria have been measured in the Powder River Basin for 25 years. DEQ completed data collection and analyses to develop a TMDL specific to bacteria. DEQ is working on the approaches for TMDLs in the Powder River Basin for other pollutants, including high water temperature and low dissolved oxygen levels, and will begin developing these TMDLs in the near future.

What type of bacteria is this addressing?

The TMDL addresses *Escherichia coli*, commonly called *E. coli*. This is one of the most common species of fecal bacteria. If *E. coli* is present in water, it's an indicator that other disease-causing organisms may also be present.

Are individual ranchers and property owners responsible for bacteria reduction plans?

Individual property owners are not responsible for developing plans to reduce bacteria. Agencies and other entities with jurisdiction over areas with bacteria sources are responsible for determining where bacteria reductions are needed and implementing plans to reduce it. In the Powder River Basin, the responsible entities

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are the U.S. Bureau of Land Management, U.S. Bureau of Reclamation, U.S. Forest Service, Oregon Department of Forestry, Oregon Department of Agriculture, Oregon Department of Transportation, Oregon Department of Fish and Wildlife, Baker County, Union County, Baker City, and Irrigation Districts. Responsible entities will have time to develop a plan that is specific to the area they have jurisdiction over. Private lands make up a large part of ODA and ODF jurisdictions, so partnering with some landowners and operators on bacteria reduction strategies will be an important part of implementing ODA's plan and ODF's rules and programs.

How do you know cattle is a primary source of bacteria, what about wildlife?

Fecal bacteria, like *E. coli*, comes from human, pet, livestock and wildlife manure. In the Powder River Basin, cows are the dominant livestock type and outnumber people (and their pets) five to one, according to the USDA Agricultural Census Survey and US Census. Cattle numbers in the basin are four times higher than the most recent statewide wildlife counts by Oregon Department of Fish and Wildlife of all species combined. Additionally, water quality data shows the highest concentrations of *E. coli* in the Powder River Basin generally occurred downstream of areas with higher densities of irrigated pastures that are seasonally grazed by cattle. Wildlife, pets and people also contribute bacteria, but at lower rates than cattle.

Why are cities allowed to discharge bacteria to streams in the basin?

Three cities in the Powder River Basin operate municipal wastewater treatment plants and discharge treated wastewater to surface waters. The Clean Water Act requires these facilities to operate in compliance with a wastewater permit from DEQ. These permits require stringent treatment, monitoring and reporting on a regular basis to show that wastewater discharges meet water quality standards for fecal bacteria and other pollutants. These requirements for treatment, disinfection, monitoring and reporting are how wastewater treatment plants limit their contribution to bacteria pollution. Similarly, management strategies and plans need to be developed to limit the nonpoint sources of bacteria, such as livestock and wildlife manure, to keep bacteria out of streams in the basin.

When, where, and how was bacteria data collected and interpreted?

DEQ has measured high bacteria levels in the basin since the late 1990s. DEQ collected over 600 bacteria samples from more than 20 sample sites across the Powder River Basin before beginning to develop this TMDL. DEQ follows data collection and quality assurance protocols that meet standards of the National Environmental Laboratory Accreditation Conference. DEQ used data on stream flows in the basin measured at gages maintained by the US Bureau of Reclamation, Oregon Water Resources Department, and Idaho Power Company. DEQ analyzed the bacteria and flow data together by developing load duration curves using a method developed by EPA. Maps showing sample sites, analytical methods and load duration curve results are included in the TMDL documents and can be found at <https://ordeq.org/powder>.

DEQ also examined bacteria samples collected between 2000 to 2019 from some of the same locations in the basin, as part of the DEQ's statewide ambient water quality monitoring program. The data does not show that bacteria levels have decreased over that time period. Although many basin landowners are implementing projects and management strategies that protect water quality, it takes time before improvements in water quality can be measured. DEQ is confident that these existing projects and TMDL implementation activities will collectively improve water quality in the basin over time. DEQ is developing a monitoring and assessment strategy to help track water quality changes during implementation of the TMDL. This additional data will help inform DEQ and landowners about locations where water quality is improving and where future management efforts and funding resources should be focused.

Why didn't DEQ use DNA analysis during TMDL development, to specify among the potential sources of fecal bacteria pollution?

DNA tracing of fecal bacteria is not an EPA-approved method for TMDL development. However, DNA testing can be a useful tool in identifying sources of fecal bacteria during TMDL implementation and monitoring. DNA testing is not needed to determine that cattle access to waterways and irrigation practices that carry manure in runoff to streams contribute significant amounts of bacteria to multiple Powder River Basin waterways. Where needed, management strategies should be put in place as soon as possible to address long-standing water quality degradation. Once implementation is underway and reporting on progress and additional monitoring begin, DNA testing at specific locations may help target bacteria reduction efforts.

Are there bacteria TMDLs in place anywhere else?

Yes. Many places in Oregon have TMDLs that have resulted in water quality improvements. For instance, DEQ issued a TMDL in the Malheur Basin in 2010 for bacteria and several other pollutants. Through partnerships with management entities, districts, the watershed council, and landowners, many projects have been implemented and are resulting in measurable water quality improvements in rivers and streams. Projects have included irrigation system improvements, installing piped water delivery systems, and sediment pond projects to trap sediment and reduce bacteria from reaching rivers and streams. Ongoing monitoring shows improvements in many locations throughout the Malheur Basin. Similar strategies are recommended in the Powder River Basin.

What happens after TMDL issuance and how long it will take to meet bacteria standards?

The TMDL sets the budget for how much bacteria streams can continually receive from all sources and still eventually achieve the water quality standards. While the analysis indicates that significant reductions in bacteria are needed, the TMDL's budget allows for ongoing bacteria inputs from a mix of land uses. The largest proportion of bacteria inputs are allocated to the most widespread uses, which are from a combination of manure runoff from irrigated pastures or directly deposited in streams by livestock, wildlife and other background sources. Wastewater and stormwater from highways contribute less bacteria and are allocated smaller proportions of the budget. DEQ works with entities identified in the TMDL to develop implementation plans that are due 18 months after the TMDL is issued. The plans specify management strategies and where they will be applied. Those entities will report on their progress annually, and DEQ and partners will begin monitoring to measure progress. The length of time until measurable changes in bacteria levels in basin streams will be seen depends on the rate at which irrigation modernization, pasture and livestock management, and other conservation projects can be funded and put in place. Based on rates of progress in the nearby Malheur Basin, DEQ estimates bacteria levels can be reduced by 50% in 10-15 years and bacteria standards can be met in 20-30 years.

For more information

Visit the [Powder Basin TMDL web page](https://ordeq.org/powder) at <https://ordeq.org/powder> or contact Vanessa Rose at vanessa.rose@deq.oregon.gov, 971-284-7882.

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